

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE																														
RESTRAINT, PHASE VI, ITEM 106 (1) LEFT (1) RIGHT ----- 0106-812146-01/02 (2) ----- 0106-812146-03/04 (2)	2/2	106FM04Y Loss of convolute positioning or failed tight line or lower gimbal sheath. Defective material, webbing or thread. Material abrasion.	END ITEM: Ballooning of convolute in areas of non-adhesion restricting wrist mobility or loss of position of soft wrist. GFE INTERFACE: Hampered wrist mobility. Crewman fatigue. MISSION: Terminate EVA. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The soft wrist design employs the use of two "tight" lines that ensure the fabric folds in the proper location. The tight lines are made of 1/2" Spec 1000 webbing and slide over the Teflon covered primary webbings. The tight lines are anchored in two places using size "E" polyester thread. The lower gimbal sheaths consist of a 6.0 oz polyester fabric reinforcement basted to a 6.0 oz polyester fabric sheath. The sheath includes a polyester cord captured in the seam allowance along each side. There are four sheath assemblies around the circumference of the lower gimbal. The assemblies locate the soft wrist relative to the lower gimbal in order to provide smooth movement. B. Test - Component Acceptance Testing: PDA: The following tests are conducted at the glove assembly level in accordance with ILC Document 0111-710112. 1. Proof pressure test at 8.0 (+ 0.2 - 0.0) psig to verify no structural damage. Certification: The glove restraint assembly was successfully tested (manned) during certification testing to duplicate operational usage (Ref. Certification Test Report for the Phase VI Glove, ILC Doc. 0111-712701). The following usage, reflecting requirements of significance to the glove restraint assembly, was documented during certification testing. The S/AD applies 229 hours in certification while the actual indicates 198 hours toward the Phase VI glove restraint in the Hamilton Sundstrand Limited Life Items list (EMU1-19-001). <table border="1"> <thead> <tr> <th>Requirements</th> <th>S/AD</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>Wrist Joint Cycles</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>Add/Abd</td> <td>17104</td> <td>14830</td> </tr> <tr> <td>Flex/Ext</td> <td>12646</td> <td>10830</td> </tr> <tr> <td>Rotations</td> <td>20112</td> <td>17393</td> </tr> <tr> <td>Pressurized Hours</td> <td>229</td> <td>198</td> </tr> <tr> <td>Pressurized Cycle @ 4.3 psig</td> <td>97</td> <td>99</td> </tr> <tr> <td>5.3 psig</td> <td>37</td> <td>63</td> </tr> <tr> <td>6.6 psig</td> <td>16</td> <td>18</td> </tr> <tr> <td>Don/Doff Cycles</td> <td>49</td> <td>49</td> </tr> </tbody> </table> C. Inspection - Components and material manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that supplier certifications have been received which provide traceability information. The following MIP's performed during the glove assembly manufacturing process assure that the failure causes are precluded from the fabricated item:	Requirements	S/AD	Actual	Wrist Joint Cycles	-----	-----	Add/Abd	17104	14830	Flex/Ext	12646	10830	Rotations	20112	17393	Pressurized Hours	229	198	Pressurized Cycle @ 4.3 psig	97	99	5.3 psig	37	63	6.6 psig	16	18	Don/Doff Cycles	49	49
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		106FM04Y		<p>1. Verification of visual inspection of convolute for absence of tears and holes.</p> <p>2. Verification of seam acceptability.</p> <p>During PDA, the following inspection points are performed at the glove assembly level in accordance with ILC Document 0111-710112:</p> <p>1. Visual inspection for material degradation.</p> <p>2. Visual inspection for structural damage after proof-pressure tests.</p> <p>D. Failure History - None.</p> <p>E. Ground Turnaround - During ground turnaround, in accordance with FEMU-R-001, the glove assembly (with TMG removed), bladder (installed) is visually inspected to extent possible for structural integrity, material damage or degradation. Glove and EMU level structural test is also performed.</p> <p>F. Operational Use - Crew Response - Pre/Post EVA: If during airlock operations, repress airlock. Consider use of backup gloves. EVA: If hand fatigue, terminate EVA.</p> <p>Special Training - Standard training covers this failure mode.</p> <p>Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-128 defines go/no go criteria related to EMU pressure integrity. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-106 GLOVE ASSEMBLY
CRITICAL ITEM LIST (CIL)

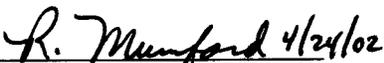
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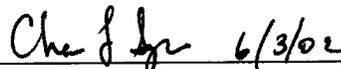
Prepared by: 
HS - Project Engineering

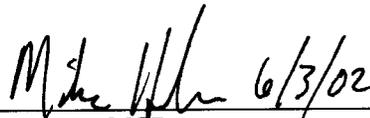
Approved by:  22mar02
NASA - SSA/SSM

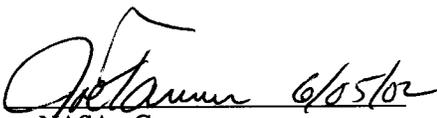

HS - Reliability

 5/23/02
NASA - EMU/SSM

 4/24/02
HS - Engineering Manager

 6/3/02
NASA - S & MA

 6/3/02
NASA - MOD

 6/5/02
NASA - Crew

 6/3/02
NASA - Program Manager